

**UNITED STATES DEPARTMENT OF COMMERCE****United States Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/429,719 10/29/99 ARATANI

K P99.2247

026263 IM22/0511
SONNENSCHN NATH & ROSENTHAL
P.O. BOX 061080
WACKER DRIVE STATION
CHICAGO IL 60606-1080

EXAMINER

MCDONALD, R

ART UNIT

PAPER NUMBER

1753

9

DATE MAILED:

05/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/429,719

Applicant(s)
Aratani et al.

Examiner
Rodney McDonald

Art Unit
1753



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Feb 8, 2001
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above, claim(s) 3-6, 8, and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7, and 10-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

Art Unit: 1753

DETAILED ACTION

Election/Restriction

1. This application contains claims 3-6, 8 and 9 are drawn to an invention nonelected with traverse in Paper No. 5. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 U.S.C. § 112

2. Claims 15 and 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, the range of less than about 1000 Angstroms is not supported by the specification. Page 16 deposits films at 1000 Angstroms. This does not support thicknesses lower than 1000 Angstroms. Page 7 indicates thickness of 500 Angstroms to 1500 Angstroms. This does not support thickness of up to 500 Angstroms. Less than 1000 angstroms includes thickness lower than 500 Angstroms.

Claim Rejections - 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

Art Unit: 1753

has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

4. Claims 1, 2, 10, 11 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nee (U.S. Pat. 6,007,899).

Nee teach that a particular silver-based alloy provides sufficient reflectivity and corrosion resistance to be used as the reflective or the semi-reflective layer in an optical storage medium, without the inherent cost of a gold-based alloy. (Column 6 lines 16-21)

The sliver is alloyed with a comparatively small amount of palladium. In this embodiment, the relationship between the amounts of palladium and silver ranges from about 0.1 a/o percent (atomic percent) to about 15 a/o percent palladium and from about 85 a/o percent to about 99.9 a/o percent silver. But preferably in respect to each metal, the alloy has from about 4 a/o percent to about 11 a/o percent palladium and from about 89 a/o percent to about 96 a/o percent silver. (Column 6 lines 30-38)

The above described binary or ternary alloy systems can be further modified by adding another element such as copper, which has an intrinsic reflectivity of more than 90 percent, or rhodium, which has an intrinsic reflectivity of about 80 percent. Copper is isomorphous with gold and palladium, but its solubility in silver is somewhat limited. Rhodium is isomorphous with palladium, but has very limited solubility in silver and gold. Therefore, if a single phase solid solution microstructure is desired in the sputtering target, the addition of copper or rhodium to the above silver-based binary or ternary alloy systems is limited to their respective solubility limits, which is about 5 a/o percent or less. However, this 5 a/o percent limit can be exceeded if a fast

Art Unit: 1753

cooling rate is used both to make the sputtering target and to apply the target as a reflective film. Thus, in total, the preferred concentration of copper or rhodium as an additive to the above-described silver-based, binary or ternary alloy systems can exceed 5 a/o percent and is from about 0.01 a/o percent to about 10.0 a/o percent. (Column 6 lines 60-67; Column 7 lines 1-11)

Having presented the preceding compositions for the starting materials, it is important to recognize that both the manufacturing process of the sputtering target and the process to deposit the target into a thin film play important roles in determining the final properties of the film. (Column 9 lines 38-42)

To this end, a preferred method of making the sputtering target will now be described. In general, vacuum melting and casting of the alloys or melting and casting under protective atmosphere, are preferred to minimize the introduction of other unwanted impurities. (Column 9 lines 43-47)

The alloys of this invention can be deposited in the well-known manners described earlier. Those being sputtering. (Column 10 lines 7-9)

In Column 11 lines 59 a reflective layer of Ag_xPd_t where $0.85 < x < 0.999$ and $0.001 < t < 0.15$ is taught. In Column 12 lines 1-4 the reflective layer incorporates Cu where the composition of the deposited reflective layer is $\text{Ag}_x\text{Pd}_t\text{Cu}_z$ where $0.0001 < z < 0.10$.

Nee teach that a laser beam having a wavelength of 780 to 820 nanometers can be utilized to focus information on the reflective layer. (Column 1 lines 50-58) Their reflective layer can be used for further generations of optical disc that use a reading laser of a shorter wavelength,

Art Unit: 1753

for example, when reading laser's wavelength is shorter than 650 nanometers. (Column 10 lines 21-25)

The film thickness can be 5 to 20 nanometers. (Column 10 line 27) Film thickness can be about 50 to 100 nanometers. (Column 10 line 42)

5. Claims 7, 12-14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohno et al. (U.S. Pat. 6,004,646).

Ohno et al. teach that to obtain a low volume resistivity in a recording medium a substantially pure Al film having an impurity content of not more than 2 atomic % or a substantially pure Au or Ag film having an impurity content of not more than 5 atomic % is preferred. (Column 10 lines 1-5)

When the above reflective layer is a thin film of an Ag alloy, one containing from 0.2 to 5 atomic % of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo, or Mn, is preferred. (Column 10 lines 23-26)

The present invention have confirmed that with the additive element to Al or the additive element to Ag, the volume resistivity increases in proportion to the concentration of the additive element. (Column 10 lines 29-32)

The reflective layer is made of a Ag alloy containing from 0.2 to 5 atomic % of at least one member selected from the group consisting of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo and Mn. (Column 39 lines 50-54)

The reflective layer is usually formed by a sputtering method. (Column 10 lines 45-46)

Art Unit: 1753

The crystallizability or the impurity composition in the layer depends on the method for preparation of the alloy target used for the sputtering and the sputtering gas (Ar, Ne, Xe or the like). (Column 10 lines 64-67)

The wavelength for recording/retrieving is at a level of from 630 nm to 660 nm relative to 780 nm for CD-RW. (Column 19 lines 8-12)

The reflective layer has a thickness of from 40 to 300 nm. (See Abstract)

The reflective layer can have chromium at the atomic percent described (i.e. additional elements 0.2 to 5 atomic percent). (Column 10 lines 23-26)

Claim Rejections - 35 U.S.C. § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1753

7. Claims 1, 2, 10, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nee (U.S. Pat. 6,007,889).

Nee is discussed above and all is as applied above.

The differences between Nee and the present claims is that the specific range of elements in the composition is not discussed, the specific thicknesses and the specific wavelengths of light utilized.

As to the specific range of compositions, thicknesses and specific wavelengths, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Aller*, et al., 105 U.S.P.Q. 233.

8. Claims 7, 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (U.S. Pat. 6,004,646) in view of Takeoka et al. (U.S. Pat. 4,647,947).

Ohno et al. is discussed above and all is as applied above. (See Ohno et al. discussed above)

The differences between Ohno et al. and the present claims is that the specific ranges of elements in the composition is not discussed.

Takeoka et al. teach a metal cover film for an optical recording medium. The metal cover film may be gold (Au), platinum (Pt), Palladium (Pd), rhodium (Rh), indium (In), copper (Cu), nickel (Ni), cobalt (Co), iron (Fe), manganese (Mn), Chromium (Cr), vanadium (V), titanium (ti),

Art Unit: 1753

zirconium (Zr), Niobium (Nb), and aluminum (Al) as well as silver. These metals may be used singly or as alloys of two or more components. These metals may be deposited by sputtering. (Column 7 lines 52-67) Thus, suggesting a range of compositions.

So as to the specific range of compositions, thicknesses and specific wavelengths, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Aller*, et al., 105 U.S.P.Q. 233.

Response to Arguments

9. Applicant's arguments filed 2-8-01 have been fully considered but they are not persuasive.

RESPONSE TO ARGUMENTS:

In response to the argument that art does not teach light beam irradiation, it is argued that Nee and Ohno, et al. teach light beam irradiation. Nee teach this at Column 1 lines 50-58; Column 10 lines 21-25. Ohno teach light beam irradiation at Column 19 lines 8-12. (See Nee and Ohno et al. discussed above)

In response to the argument that a range within a range is not obvious, it is argued that Nee teach a range of Pd being from 0.1 to 15 atomic percent Pd. Applicant's range falls within this range and therefore the prior art suggests the range claimed. It is argued that Ohno teach a range of Pd, Ti and Cr in the range of from 0.2 to 5 atomic %. This range overlaps Applicants

Art Unit: 1753

range of 0.1 to 1.5 atomic % for Pd, 0.1 to 2.9 atomic% for Ti and 0.1 to 3.5% for Cr. Applicant has also not shown unexpected results for their claims.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 1753

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney McDonald whose telephone number is (703) 308-3807.



RODNEY G. MCDONALD
PRIMARY EXAMINER

RM

May 10, 2001